NATIONAL WEATHER SERVICE

DECISION SUPPORT NEWSLETTER, SPRING 2012

SPRINGFIELD, MO www.weather.gov/springfield

The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy.

INSIDE THIS ISSUE:

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A Refresher: Severe Weather Products

The Springfield, Missouri National Weather Service Forecast Office issues warnings for severe thunderstorms, tornadoes and flooding for 34 counties in southwestern Missouri and 3 counties in extreme southeastern Kansas. Severe weather warnings for severe thunderstorms, tornadoes, and flash flooding are issued for conditions meeting certain criteria, which are explained below. Severe weather products are issued following a "**Ready**" , "**Set**", "**Go**" concept as the event approaches and confidence of occurrence increases.

Severe Thunderstorm Warnings

Issued for thunderstorms producing :

Damaging winds of 58 mph (50 kts) or greater and / or large hail of 1" in diameter or larger.

Tornado Warnings

Issued when a tornado has been detected NWS Doppler radar or reported by storm spotters.

Flash Flood Warnings

Issued for rapidly rising water that poses a threat to life and property including low water crossings and urban areas.

Ready

Daily Hazardous Weather Outlook issued to highlight potential weather hazards through 7 days.

http://www.crh.noaa.gov/sgf/?n=hwo

Be ready for potential weather hazards.

Set

The Storm Prediction Center issues Severe Thunderstorm and Tornado Watches 2 to 6 hours in advance of severe storm development.

http://www.spc.noaa.gov/

Severe weather is possible. Monitor and be prepared to take action.

Go

Warnings are issued when severe weather is detected by radar or reported by spotters.

http://www.crh.noaa.gov/hazards/sgf

Severe weather occurring or imminent. Take immediate action to protect life and property from severe storms.

IMPACT BASED WARNINGS PROJECT

On April 2nd, the National Weather Service office in Springfield, MO began taking part in a severe weather warning pilot project that will run through November 2012. The target audience for this project is our Emergency Management and media partners. The goal of this project is to 1) Improve communication of risk, 2) Highlight potential impacts, and 3) Make important information easier to find within the warning message

The main changes to the warnings will be the addition of "tags", or short descriptors at the very end of a warning, that are considered supplemental data (generally not seen by the public). We will issue Severe Thunderstorm Warnings as we have in the past and continue to add hail and wind tags at the very bottom of the warning as we have in the past. However, if we are anticipating the hail size to be 2.75 inches (baseball size) or larger and/or the winds to be 80 mph or greater, the follow up statement will included within the body of the warning, "This is a very dangerous storm". These selections will ***not*** require a new warning to be issued.

In ***rare*** cases, a particular storm may have a small potential for a tornado (land spout, squall line tornado) and the forecaster's confidence is too low to issue a Tornado Warning. In this case, within the initial Severe Thunderstorm Warning or follow-up Severe Weather Statement, a "Tornado...Possible" tag may be appended within the supplemental data at the very bottom of the warning. This allows those in decision making positions an opportunity to follow that particular storm a bit closer and monitor for a potential upgrade to a Tornado Warning.

Tornado Tag	
TORNADO...RADAR INDICATED	Evidence on radar and near storm environment is supportive, but no confirmation.
TORNADO...OBSERVED	Tornado is confirmed by spotters, law enforcement, etc.
Tornado Damage Threat Tag	
TORNADO DAMAGE THREAT...SIGNIFICANT	When there is credible evidence that a tornado, capable of producing significant damage, is imminent or ongoing.
TORNADO DAMAGE THREAT...CATASTROPHIC	When a severe threat to human life and catastrophic damage from a tornado is occurring, and will only be used when reliable sources confirm a violent tornado.
Tornado Tag In Severe Thunderstorm Warnings	
TORNADO...POSSIBLE	A severe thunderstorm has some potential for producing a tornado although forecaster confidence is not high enough to issue a Tornado Warning.

Tornado warnings will continue to be issued as they have in the past and specify whether the tornado was "RADAR INDICATED" or "OBSERVED," by a spotter, law enforcement, etc. However, two new damage tags have been developed, Damage Threat Significant and Damage Threat Catastrophic. The first of these two tags will only be used in rare circumstances where environmental conditions, interrogating radar data, and/or observations from spotters indicate there is a greater risk for life threatening significant damage. This tag will convey that extremely significant damage is imminent or occurring. The tag will occur at the bottom of the warning, "TORNADO DAMAGE THREAT...SIGNIFICANT." The intent of this tag is to better convey potential risk and impacts within the warning message. This will not require a new warning, but will be appended to the bottom of a follow up severe weather statement or initial warning.

In ***EXCEEDINGLY RARE*** cases the tag, "TORNADO DAMAGE THREAT...CATASTROPHIC" may be utilized when a **confirmed tornado** poses a severe threat to human life and catastrophic tornado damage is imminent or ongoing. The NWS may issue a new warning if this is expected as it may be in everyone's best interest to be alerted again for such a catastrophic event. Within the body of the warning, the phrase "A TORNADO EMERGENCY FOR 'XXX' CITY" will be added into the warning text.

Once again, the use of this tag would be exceedingly rare and would only be used when reliable sources confirm a tornado or there is clear radar evidence of the existence of a damaging tornado such as the observation of a debris/damage signature.

For more information visit: http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=crh&storyid=79552&source=0

Building a Weather-Ready Nation

A Team Effort

In August of 2011, the National Weather Service (NWS) presented a plan to build a Weather-Ready Nation. This plan is a response to the number of high profile weather events our nation has faced over the past few years. The purpose of the Weather-Ready Nation initiative is to save more lives and livelihoods. The NWS hopes to accomplish this by increases in technology, working side by side with core partners, and increasing the public's awareness and knowledge of significant weather events. By increasing the nation's weather-readiness, the country will be prepared to protect, mitigate, respond to and recover from weather-related disasters.

Effectively turning the United States into a Weather-Ready Nation cannot be done by the NWS alone. Society's ability to prepare for natural disasters requires a societal response equal to the risk at hand (ex: immediate reaction to a Tornado Warning). The NWS is counting on our core partners to help in this effort, which include emergency managers, media, researchers, the insurance industry, non-profits, the private sector, other government agencies, and more.

How Will This Be Accomplished?

Many projects are currently underway in helping us build toward a Weather-Ready Nation. This includes several operational initiatives from increasing lead times on severe weather warnings to improving how we communicate our forecasts to the public. For example, the network of WSR-88D Doppler radars is being upgraded to the new Dual-Pol technology. This upgrade will improve the way we interrogate storms on radar, providing a way to view storms in a way that has never been seen before. There is also exciting work being done to improve the nations satellite fleet, as well as work internally with new software and tools developed to increase forecast and warning accuracy.

Even with all the technological improvements, the foundation for building a Weather-Ready Nation begins with communication. If we are inefficient communicators, no amount of technological improvements will increase our ability to provide a valuable service to the American public. For us here at NWS Springfield, we understand that in order for us to be effective communicators, it all starts with listening. We have made great strides to become better and more effective communicators of pertinent information and risk, and we attempt to accomplish this by first learning and listening to our core partners and users, specifically to their needs, thresholds, and decision criteria. This is why we have continued to foster and develop effective working relationships with our core partners. Examples of this include Spotter talks, State Park visits, meetings with MODOT and KDOT, meetings with School Administrators, meetings with media partners, fire weather support meetings with the U.S. Forest Service, airport visits, etc. Everyone who utilizes our data to make decisions is important to us and we will continue to improve our services to better the lives of the people of southeastern Kansas and southwestern Missouri, but to do so we will need your help.

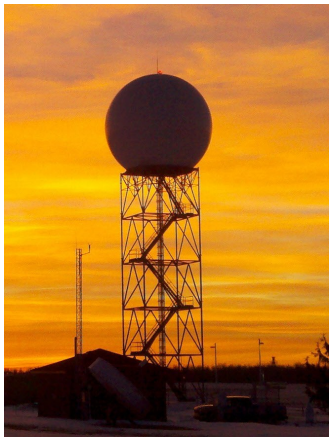
More Information

http://www.nws.noaa.gov/com/weatherreadynation/
http://www.nws.noaa.gov/com/weatherreadynation/partners.html
Severe Weather Preparedness: http://www.ready.gov

WSR-88D Upgraded to Dual-Polarization

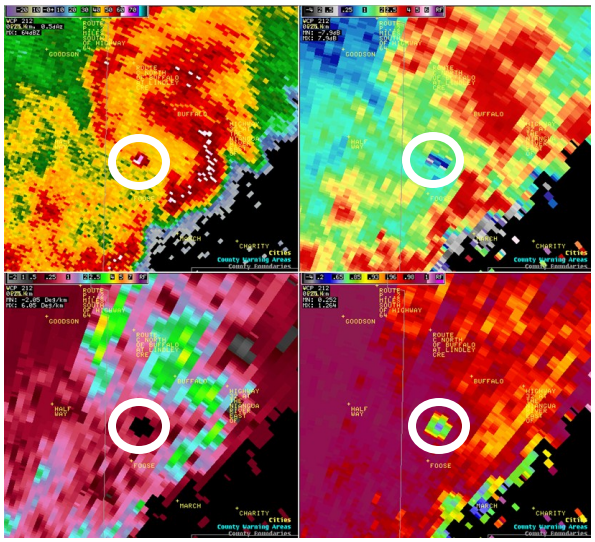
The WSR-88D Doppler Radar at the Springfield NWS office was recently upgraded to Dual-Polarization technology, or Dual-Pol for short. This upgrade has added a vertical pulse of energy to the existing horizontal pulse of the WSR-88D. Now, with the addition of the vertical signal channel, the radar will be able to measure the shape of the precipitation as well as intensity, giving meteorologists the ability to differentiate between different types of precipitation--rain, hail, sleet, snow, or a mix! This will also result in much better estimates of rainfall, giving forecasters better tools and information to use when issuing Flood and Flash Flood Warnings.

While the benefits to winter weather and flash flood services are expected to be immediate, research continues on how dual polarization technology will help when severe thunderstorms and tornadoes threaten. Initial research suggests that there's the potential for better identifying areas of large hail, as well as identifying when a tornado is causing damage in a given location. As more radars are upgraded across the country in the coming months and years, forecasters will likely discover new radar applications that allow them to better serve NWS customers!



The Benefits of Dual-Pol

The image to the right is the radar image of the 29 February 2012 Buffalo, MO EF-2 tornado. The upper left is *reflectivity*, which shows the intensity of precipitation at a given location. The higher returns (more power being reflected back to the radar) are indicated by the red and white colors. The other three images are all new with the Dual-Pol upgrade. The upper right image is the Differential Reflectivity (ZDR), the lower right is the Correlation Coefficient (CC), and the lower left is the Specific Differential Phase (KDP).



Note the small area of higher returns in the center of the Reflectivity image (top left) and the corresponding low Correlation Coefficient in the lower right (indicated by the white circle). Values of CC near 1.00 (high correlation), shown by the deep reds and pinks, tell us the radar is sampling near uniform hydrometeors (raindrops, etc.) in both the horizontal and the vertical pulses being sent from the radar. When the radar begins to sample hydrometeors that vary in size and shape, the value of CC will decrease. Because tornado debris varies considerably in size and shape, debris being lofted into the air will show up as an area of very low CC, as seen in the bottom right. This is known as a Tornadic Debris Signature, or TDS.

Enhanced reflectivity signatures, often called "debris balls", have been seen in the past with extremely strong tornadoes, such as the tornado that struck Joplin. The dual-pol TDS is much more sensitive than reflectivity alone, resulting in signatures from much weaker tornadoes.

For More Information and Training for Core Partners visit the following web sites:

Training http://www.wdtb.noaa.gov/courses/dualpol/outreach/

Information http://www.nssl.noaa.gov/dualpol/

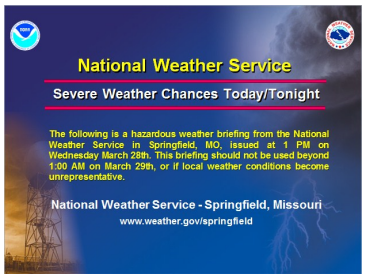
Communication Tools

Multimedia Weather Briefings

Get in the heads of our forecasters by remembering to check out the multimedia weather briefing posted to our web page. These briefings are created and posted to our page when significant weather is expected across the Ozarks.

Briefings provide critical weather information to our core users and customers first hand from the forecasters.

These briefings will contain headline text and graphics to provide an overview of an event. Multimedia Hazardous Weather Briefings will generally be issued prior to hazard weather events. It is important to note that these briefings are not a substitute for other NWS products and warnings, but serves to compliment these services.



http://www.crh.noaa.gov/sgf/?n=webbriefing

Web briefings may be submitted for the following events.

- Severe Weather
- Flooding
- Winter Storm.
- Other significant events - High Wind, Fire Weather, etc.

National Weather Service Chat

Partners in the emergency management, law enforcement, and media communities are encouraged to actively participate in NWSChat. NWSChat is an application that allows real-time communication between forecasters and important partners. Along with the opportunity to ask forecasters for additional information, clarification, or to pass on storm reports, each chat room is automatically populated with the latest watches, warnings, and advisories, and updates to important products like the Hazardous Weather Outlook and Area Forecast Discussion. This feature provides users with an excellent monitoring and situational awareness tool during potentially hazardous weather events.

NWSChat is currently open to those in the media, emergency management, and law enforcement communities, as well as other local, state, and Federal government partners. NWSChat can be utilized on Windows, Linux, and Macintosh operating systems. Several applications for mobile devices have also been recently developed.

Additional information on NWSChat is available at

https://nwschat.weather.gov/

Don't Forget! NWS Springfield is on Facebook!

National Weather Service Forecast Offices, including the office in Springfield, continue to have a presence on Facebook. These pages will be used to post general weather information, call attention to note-worthy weather events across eastern Kansas and southwestern Missouri, as well as around the country, and provide an avenue for the public to interact with the National Weather Service.

Please note, Facebook will not be used as an official means to obtain forecasts or warning information; NOAA Weather Radio, local media, and weather.gov/sgf should be used to get information during severe weather events. However, friends of the NWS are encouraged to pass on any reports of severe weather.

To visit the NWS Springfield Facebook page, visit the following link:

http://www.facebook.com/US.NationalWeatherService.Springfield.gov

DECISION SUPPORT EFFORTS

Over the past several months, the NWS in Springfield, MO has visited with several core partners including emergency management, media, Electric Cooperatives, School Superintendents, Missouri State Parks, Corp of Engineers, and Department of Transportation.

These visits have allowed us to better understand the needs of our partners, and develop user profiles and impact catalogs. Understanding weather risks and impacts affecting you, our core partners, and the decisions you have to make will allow us at NWS Springfield to better serve you.

Thanks you for your support!

PREVIEW OF COMING CHANGES

Take a look at the preview of the new proposed National Weather Service web page: http://preview.weather.gov/

Here is a preview of the proposed new National Weather Service mobile service: http://preview.weather.gov/mobile/

ABOUT THE NATIONAL WEATHER SERVICE

SPRINGFIELD, MO FORECAST OFFICE

The mission of the National Weather Service, part of the National Oceanic and Atmospheric Administration and Department of Commerce, is to issue weather, water, and climate forecasts and warnings for the protection of life and property and enhancement of the National economy. This mission is carried out by the dedicated men and women at 122 Weather Forecast Offices around the United States.

The Springfield National Weather Service Forecast Office has 24 hours a day, 7 days a week forecast and severe weather warning responsibility for 37 counties in southern and southwestern Missouri and extreme eastern Kansas. In addition, specialized forecasts are issued for aviation interests at the Springfield, Branson, and Joplin airports. The office is also one of 92 stations with responsibility for twice a day weather balloon observations.

More information on the Springfield, MO Forecast Office, as well as local forecast information, can be found on our website,

www.weather.gov/springfield

Information on other Forecast Offices around the country, as well as forecasts across the United States, can be found at **www.weather.gov**.

ABOUT THIS PUBLICATION

This publication has been designed to enhance readiness and decision response by the emergency management community, media, DOT, and other critical partners. Decision Support Newsletters will generally be published around 4 times a year, usually at the start of a new season, and oftentimes the start of a new set of weather hazards across eastern Kansas and the Missouri Ozarks.

Featured topics each season will include information on NWS watch, warning, and advisory products, as well as decision support tools such as GIS resources, web-based forecast services, and communication tools.

If you have a suggestion about information that you'd like to see in this publication, or feedback on National Weather Service products and services, please don't hesitate to contact us.

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